

WHAT IS CLAIMED IS:

1. A scanning optical system comprising:  
light source means for emitting a light flux;  
deflection means for deflecting the light flux  
5 emitted from the light source means; and  
scanning optical means for guiding the light  
flux deflected by the deflection means onto a surface  
to be scanned and scanning the surface, the scanning  
optical means including a fine structural grating on  
10 at least one optical surface thereof,  
wherein the fine structural grating has a  
triangular grating in which a plurality of triangular  
grating parts are arranged in one dimensional  
direction, and  
15 wherein when a grating height of a triangular  
structure of the triangular grating is given by  $h$ , a  
grating pitch thereof is given by  $P$ , and a wavelength  
of the light flux emitted from the light source means  
is given by  $\lambda$ , conditions of  
20  $0.23\lambda \leq h$  and  
 $0.52 < h/P$   
are satisfied.

2. A scanning optical system according to claim  
25 1, wherein a light flux incident into the fine  
structural grating is substantially P polarized light.

3. A scanning optical system according to claim 1, wherein when a light flux incident into the fine structural grating is substantially S polarized light, conditions of

5            $0.35\lambda \leq h$  and

$0.80 < h/P$

are satisfied.

4. A scanning optical system comprising:

10           a light source means for emitting a plurality of light fluxes;

          deflection means for deflecting the plurality of light fluxes emitted from the light source means; and

15           scanning optical means for guiding the plurality of the light fluxes deflected by the deflection means onto a surface to be scanned and scanning the surface, the scanning optical means including a fine structural grating on at least one  
20   optical surface thereof,

          wherein the fine structural grating has a triangular grating in which a plurality of triangular grating parts are arranged in one dimensional direction, and

25           wherein when a grating height of a triangular structure of the triangular grating is given by  $h$ , a grating pitch thereof is given by  $P$ , and a shortest

wavelength of wavelengths of the plurality of light fluxes emitted from the light source means is given by  $\lambda_{\min}$ , conditions of

$$0.23\lambda_{\min} \leq h \text{ and}$$

5  $0.52 < h/P$

are satisfied.

5. A scanning optical system according to claim 4, wherein a light flux incident into the fine structural grating is substantially P polarized light.

6. A scanning optical system according to claim 4, wherein when a light flux incident into the fine structural grating is substantially S polarized light, conditions of

$$0.35\lambda_{\min} \leq h \text{ and}$$

$$0.80 < h/P$$

are satisfied.

7. A scanning optical system according to claim 4, wherein:

the light source means includes a plurality of light source sections for emitting different polarized light fluxes;

the scanning optical system further comprises a beam combining means for combining the different polarized light fluxes on optical paths, the beam

combining means being located between the light  
source means and the deflection means; and  
conditions of

$$0.35\lambda_{\min} \leq h \text{ and}$$

5  $0.80 < h/P$

are satisfied.

8. An image forming apparatus comprising:

a scanning optical system according to claim 1;

10 a photosensitive member located on a surface to  
be scanned;

a developing unit for developing as a toner  
image an electrostatic latent image formed on the  
photosensitive member by the light flux for scanning  
15 from the scanning optical system;

a transferring unit for transferring the  
developed toner image to a material to be  
transferred; and

20 a fixing unit for fixing the transferred toner  
image to the material to be transferred.

9. An image forming apparatus comprising:

a scanning optical system according to claim 1;

and

25 a print controller for converting code data  
inputted from an external device into an image signal  
and inputting the image signal to the scanning

optical system.

10. A color image forming apparatus comprising:  
a plurality of scanning optical systems  
5 according to claim 1; and  
a plurality of image bearing members, each of  
which is located on a surface to be scanned, of a  
corresponding scanning optical system, the plurality  
of image bearing members forming images having colors  
10 different from one another.

11. A color image forming apparatus according  
to claim 10, further comprising a print controller  
for converting a color signal inputted from an  
15 external device into image data corresponding to  
different colors and for inputting the image data to  
the respective scanning optical systems.